AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Original) A method of determining the stopped angular position of a rotor in a stator of a polyphase synchronous rotary electrical machine, the stator having a plurality of windings adapted to create a magnetic field driving rotation of the rotor and each winding having one or more terminals for applying a supply voltage,

which method comprises the following steps:

a) applying a first sequence of successive voltage vectors to the terminals of the windings, each voltage vector defining the value of the non-zero voltage to be applied simultaneously to the supply terminals of each winding, said first sequence including first and second voltage vectors adapted to modify the electrical characteristics of the windings when the driving magnetic field created by the windings is added to the magnetic field of the rotor and a third voltage vector adapted to cancel out the torque created by applying the first and second voltage vectors,

b) determining a response signal from all of the windings to application of the first voltage vector and then a response signal to application of the second voltage vector, said response signals being correlated to the angular position of the rotor, and

c) establishing the angular position of the rotor with an uncertainty of ±90° from the signals determined in the step b).

2. (Previously Presented) A method according to claim 1, further comprising the following steps:

d) iterating the step a) $\underline{n}$ times with, on each iteration, a new sequence of voltage vectors including a voltage vector offset angularly relative to the voltage vectors of the preceding sequences, wherein $\underline{n}$ is a positive integer,

e) on each iteration of the step d), determining, at least for the angularly offset vector, a response signal from each winding to application of said voltage vector, said response signal being correlated to the angular position of the rotor, and

f) using the results of the step e) to reduce the uncertainty as to the position established during the step c).

3. (Original) A method according to claim 2, wherein each new sequence of voltage vectors applied further comprises first and second voltage vectors adapted to modify the electrical characteristics of the windings when the driving magnetic field created by the windings is added to the magnetic field of the rotor and a third voltage vector adapted to cancel out the torque created by application of the first and second voltage vectors.

4. (Original) A method according to claim 2, including a step of automatically choosing the angular offset of said at least one offset voltage vector of each new sequence, which offset may be arbitrary.

5. (Original) A method according to claim 4, wherein the choice of the angular offset is made automatically so as to halve the uncertainty as to the angular position.

6. (Original) A method according to claim 1, wherein the first and second voltage vectors are in opposite directions.

7. (Original) A method according to claim 1, wherein the third voltage vector is collinear with and in the same direction as the first voltage vector.

8. (Original) A method according to claim 1, wherein the first and second voltage vectors of each sequence are of equal amplitude.

9. (Original) A method according to claim 1, wherein all the voltage vectors of each of said sequences are of equal amplitude.

10. (Original) A method according to claim 1, wherein each voltage vector is obtained by means of a Concordia transformation.

11. (Original) A method according to claim 1, wherein applying each voltage vector causes a current vector to appear that is defined on the basis of the value of all the currents flowing simultaneously in each of the windings of the stator and said signal which is a function of the angular position of the rotor is the time that elapses between the instant at which the amplitude of the current vector is zero and the instant at which the amplitude of the current vector crosses a predetermined threshold.

12. (Original) A method according to claim 11, wherein the predetermined threshold corresponds to the maximum current that can flow in the windings without damaging them.

13. (Original) A method according to claim 1, wherein applying each voltage vector causes the appearance of a current vector that is defined on the basis of the value of all the currents flowing simultaneously in each of the windings of the stator and said signal which is a function of the angular position of the rotor is the value of the amplitude of the current vector after a predetermined time interval starting from the instant at which the amplitude of the current vector is zero has elapsed.

14. (Original) A method according to claim 1, wherein each voltage vector defines the voltage applied to only one voltage application terminal of each winding.

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15. (Original) A method according to claim 14, wherein the response signal is determined at the terminals to which the voltage vectors are applied.

16. (Original) A computer adapted to determine the stopped angular position of a rotor in a stator of a polyphase synchronous rotary electrical machine, the stator having a plurality of windings adapted to create a magnetic field driving rotation of the rotor and each winding having one or more supply voltage application terminals,

which computer is adapted to:

a) command the application of a first sequence of successive voltage vectors to the terminals of the windings, each voltage vector defining the value of the non-zero voltage to be applied simultaneously to the supply terminals of each winding, said first sequence including first and second voltage vectors adapted to modify the electrical characteristics of the windings when the driving magnetic field created by the windings is added to the magnetic field of the rotor and a third voltage vector adapted to cancel out the torque created by applying the first and second voltage vectors,

b) determine a response signal from all of the windings to application of the first voltage vector and then a response signal to application of the second voltage vector, said response signals being correlated to the angular position of the rotor, and

c) establish the angular position of the rotor with an uncertainty of ±90° from the signals determined in the step b).

17. (Currently Amended) A computer according to claim 16, further adapted to:

d) iterate the step a) n̲ times with, on each iteration, a new sequence of voltage vectors including a voltage vector offset angularly relative to the voltage vectors of the preceding sequences, wherein n̲ is a positive integer,

e) on each iteration of the step d̲)̲, determine, at least for the angularly offset vector, a response signal from each winding to application of said voltage vector, said response signal being correlated to the angular position of the rotor, and

f) use the results of the step e) to reduce the uncertainty as to the position established during the step c).

18. (Original) A computer according to claim 16, capable of automatically choosing the angular offset of said at least one offset voltage vector of each new sequence, which offset may be arbitrary.

19. (Original) A computer according to claim 18, capable of automatically choosing the angular offset so as to halve the uncertainty as to the angular position.

20. (Original) A control unit for a synchronous rotary electrical machine, said control unit comprising:

- a circuit for applying a voltage to the synchronous rotary electrical machine, and

- a computer adapted to control the voltage application circuit,

wherein the computer conforms to claim 16.

21. (Original) A system for driving rotation of a rotor, said system comprising:

- a synchronous rotary electrical machine adapted to drive rotation of the rotor, and

- a control unit for the synchronous rotary electrical machine,

wherein the control unit conforms to claim 20.